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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,486

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Tomoyuki Kanno

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EXAMINER

BEHM, HARRY RAYMOND

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,486	Applicant(s) KANNO, TOMOYUKI	
	Examiner HARRY BEHM	Art Unit 2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to the amended claims filed 7/21/08 have been considered but are not persuasive. Applicant argues Ohsawa in view of Bonnet does not disclose a voltage-doubler circuit connected between the secondary side and the booster circuit for providing the discharge lamp a voltage which is obtained by adding an output voltage of the rectification circuit to the output voltage of the secondary side. However, Bonnet clearly teaches such a voltage doubler circuit in Fig. 10.

Applicant argues it would not have been obvious to one of ordinary skill in the art at the time of the invention to add the voltage-doubler circuit C4, D5 and D6 disclosed in Fig. 10 of Bonnet to the circuitry of Ohsawa, since the booster circuit 12 of Ohsawa does not have an input port to accept the output voltage from the alleged voltage-doubler circuit of Bonnet. However, booster and inverter circuits were well known at the time of the invention and it would have been straight forward to connect the voltage doubler and inverter to the booster circuit. Examiner has referenced Kassapian to demonstrate a well known booster topology (Fig. 1 D1,C1,Phi1) in which a voltage supply Vcc is coupled to a booster capacitor C1 through D1, and an inverter output Phi1 is connected to the other end of the capacitor. It would have been as simple as connecting the inverter output (Ohsawa Fig. 3 11) to Phi1 and the voltage doubler output (Bonnet Fig. 10 D6) as D1. Implementing a booster by coupling a dc supply through a diode to one end of a capacitor and connecting an inverter to the opposite

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end of the capacitor was well known at the time of the invention and would have been obvious to a person of ordinary skill in the art.

Applicant argues the Office Action fails to articulate why a person of ordinary skill in the art would connect the output of D6 of Bonnet to the booster circuit 12 of Ohsawa in Fig. 3. However, Bonnet provides motivation for making such a connection by teaching the voltage doubler circuit results in less stress on the components and improves the output: "all the auxiliary circuit components are subjected to a maximum voltage equal to: $m \cdot V_{kpeak}$. With a classic topology, that nominal operating would be achieved only with significantly higher voltage strain on the power devices" (Bonnet column 4, lines 49-53) and "using auxiliary circuits at the converter secondary as shown in [FIG. 10], improves again the converter output characteristic", (Bonnet column 5, lines 7-9)

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the booster circuit provides the voltage to the discharge lamp only when the lamp is lit.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the booster circuit provides the voltage to the discharge lamp only when the lamp is lit, as in claim 2, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In paragraphs 37-38 of the specification, the disclosure supports the booster circuit includes a spark gap, and when the discharge voltage is exceeded in the booster circuit, then a lighting voltage is supplied to the discharge lamp, but the specification is silent as to the booster circuit providing the voltage to the discharge lamp only when the lamp is lit.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohsawa (US 2003/00808695) in view of Bonnet (US 5,856,916) and further in view of Kassapian (US 5,589,793).

With respect to Claim 1, Ohsawa discloses a high voltage discharge lamp (Fig. 3 13) lighting apparatus comprising:

a rectification circuit (Fig. 3 4) connected to a secondary side (Fig. 3 1s) of a transformer for receiving an output voltage of said secondary side and performing a forward function (Fig. 3 21) and a flyback function (Fig. 3 22);

an inverter circuit (Fig. 3 11) connected to the rectification circuit (Fig. 3 4);

a booster circuit (Fig. 3 12) connected to the inverter circuit (Fig. 3 11) and discharge lamp (Fig. 3 13) for providing high voltage to the discharge lamp. Ohsawa does not disclose a voltage-doubler circuit in addition to the rectification circuit.

Bonnet teaches a voltage-doubler circuit (Fig. 10 C4,D5) connected between a secondary side (Fig. 10 Vs) for providing a discharge lamp a voltage (Fig. 10 Vout) which is obtained by adding an output voltage of the rectification circuit (Fig. 10 Vcs) to the output voltage of the secondary side (Fig. 10 Vs).

It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the voltage doubler circuit between the secondary side and the booster circuit. The reason for doing so is "all the auxiliary circuit components are subjected to a maximum voltage equal to: $m \cdot V_{kpeak}$. With a classic topology, that nominal operating would be achieved only with significantly higher voltage strain on the power devices" (Bonnet column 4, lines 49-53) and "using auxiliary circuits at the converter secondary as shown in [FIG. 10], improves again the converter output characteristic", (Bonnet column 5, lines 7-9).

Ohsawa and Bonnet do not detail the inverter and booster circuits. Kassapian discloses a well known booster topology in Fig. 1 formed from a DC voltage supply V_{cc} , diode D1, capacitor C1 and half bridge inverter output $\Phi 1$. It would have been obvious to one of ordinary skill in the art at the time of the invention to have implemented the booster (Ohsawa Fig. 3 12) with capacitor C1, by having connected the voltage doubler (Bonnet Fig. 10 C4,D5) voltage supply (Bonnet Fig. 10 V_{out}) to C1 (Bonnet Fig. 10 D6 becomes D1) and having connected the inverter (Ohsawa Fig. 3 11) to $\Phi 1$. The output voltage of C1 would have been the booster output voltage delivered to the discharge lamp (Ohsawa Fig. 3 13). The reason for doing so is it is well known to implement "a voltage booster circuit whose principle is that of the "charge pump"" (Kassapian column 1, lines 24-25).

With respect to Claim 2, Ohsawa in view of Bonnet and Kassapian disclose the high voltage discharge lamp lighting apparatus according to claim 1, wherein the

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booster circuit provides the voltage to the discharge lamp only when the lamp is lit since the lamp is a discharge device and it is well known to discharge only when the voltage has exceeded a spark gap.

With respect to Claim 3, Ohsawa in view of Bonnet and Kassapian disclose the high voltage discharge lamp lighting apparatus according to claim 1, wherein the voltage-doubler circuit consists of a diode (Bonnet Fig. 10 D5) and a capacitor (Bonnet Fig. 10 C4).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to HARRY BEHM whose telephone number is (571)272-8929. The examiner can normally be reached on 7:00 am - 3:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm E. Ullah can be reached on (571) 272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry Behm/
Examiner, Art Unit 2838

/Jeffrey L. Sterrett/
Primary Examiner, Art Unit 2838